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RESPONSES OF THE GREEN POWER INSTITUTE TO THE QUESTIONS ON THE 33% RPS IMPLEMENTATION ANALYSIS PRELIMINARY RESULTS

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Questions on 33% RPS Implementation Analysis Preliminary Results Report

1. Q: Has this study produced information that is useful for planning or policymaking purposes? Would a more detailed study provide additional value for either planning or policy purpose, or both?

A: The study highlights the need to prioritize policy goals. Some of the goals are competing, and we as GPI, as well as other parties and the Commission, need to decide which of the goals we consider most important. The GPI sees market transformation and in-state renewable generation as being very important goals, but we also need to keep the pressure on for the overall 33% x 2020 goal. For planning purposes the timelines and scenarios presented in the report can help to give a picture of what might happen as renewables are developed, but it is important for the Commission to be flexible and adjust as circumstances warrant.

2. Q: Do you agree with the study's general conclusions that (a) the 2020 timeline is aggressive, (b) the state's process reforms are likely to speed the timeline, (c) the state faces risks that are outside of its control that can affect the state's ability to achieve 33% on a given timeline, (d) the rate impacts of 33% relative to 20% are in the 3-10% range, and (e) there are tradeoffs among the different strategies for achieving 33%?

A: (a) The 2020 timeline is aggressive, but it is not unachievable. The 2020 timeline is feasible, as long as obligated LSEs move aggressively to achieve it. Postponing the timeline will simply result in more foot dragging, and not accomplish anything.

(b) The state's process reforms are likely to speed the timeline, but only if they can be passed and acted on quickly and implemented effectively.

(c) The state will always face outside and uncontrollable risks to achieving the 33% goal on any given timeline, but some of these risks can be mitigated by effective forward planning, or corrected before they happen. Having a diverse group of renewables can also buffer against any given set of risks.

(d) We do not agree with the study's general conclusion that the rate impact of 33% renewables relative to 20% will be in the 3-10% range. We believe that this is still very much an open question. The study suffers from an imbalanced treatment of the risks and transmission needs of renewables vs. alternative scenarios, and the imbalanced treatment tends to exaggerate the costs of renewables. In particular, the study includes substantial

costs for the transmission improvements associated with developing new renewables zones (CREZs), but does not include a consideration of the transmission needs and costs of new fossil generators, which are themselves not trivial. Moreover, the study fails to distinguish between what RETI calls "no regrets" investments, which serve system-wide needs, and investments that are specific to opening up remote renewables-rich zones, instead leaving the impression that all new transmission proposed for the state is attributable to the renewables program. Only a small fraction of the total is attributable directly to renewables.

(e) There are tradeoffs among the different strategies for achieving the 33% goal. These tradeoffs invoke the need to set priorities about which policy goals we seek to promote as the most important. It will also be important to look at assessments of likely-to-become operational, which would help to elucidate how much capacity is likely to actually come through the development obstacle course when comparing the strategies. This might help to show if certain strategies are more realistic or resilient than others.

3. Q: The goal of the resource ranking and selection process was to produce "plausible", but not necessarily "optimal" portfolios for achieving a 33% RPS by 2020. Under the assumption that 33% itself is plausible, do you believe the resource mixes that are modelled are "plausible"? If not, what would a plausible resource mix be? How would you alter the modelling process to produce plausible portfolios?

A: We think that the modelled resource mixes are "plausible," based on the scenarios that have been presented. However, we believe that an important scenario has been left out of the analysis: one that is geared towards baseload renewables in California like biogas, biomass, and geothermal. Baseload renewables provide approximately 67% of the renewable energy that is being generated in California today, and there are sufficient resources in the state to develop considerable additional baseload-renewable generating capacity. A scenario weighted towards baseload renewables is needed.

4. Q: The 33% RPS Reference Case relies heavily on resources that have been selected through IOU solicitations and are therefore represented in the CPUC ED RPS project database. Do you agree with the methodology for treating CPUC Database (i.e., treating their costs as "sunk" for ranking purposes)? If not, what would be an alternative method of incorporating those projects?

A: We do believe that the base-case scenario should rely heavily on the existing portfolio of RPS contracts, although we cannot comment on the exact methodology that was employed in the analysis. In order to properly treat the contracts in the existing portfolios, it is important that realistic estimates of their probability of success be employed, including, for example, using lower probabilities for technologies that are not commercially demonstrated than for technologies that have been proven in the commercial marketplace. The GPI recommends using a probability of success of no greater than 70% for projects using commercial technology. The probability of success for some of the

more exotic technologies that have been proposed in California should be very low indeed, some close to zero.

5. Q: After exhausting thee CPUC ED Database projects, the model fills the remaining need using RETI pre-ID or proxy projects. Do you agree that RETI is a reasonable source of additional project availability and performance data?

A: RETI seems like a reasonable source of information for additional project data, especially as we know of no other source of information that might provide similar data. However, it is important to understand the limitations of the database for the RETI project. In particular, the RETI project was designed specifically to study the extension of transmission access to remote, renewable-resources rich areas of the state (CREZs), and therefore the study focuses on resources lying in identified CREZs. Resources that are located outside of CREZs, like most of the biogas and biomass resources in the state, as well as DG, are given relatively less consideration in the RETI study than resources inside the CREZs. In a study like the *33% RPS Implementation Analysis*, the non-CREZ resources should be accorded at least equal consideration to those in CREZs.

6. Q: In addition, the model relies on out-of-state resource availability and performance data from E3's GHG Calculator (the original data came from NREL and EIA). Do you agree that out-of-state projects are characterized accurately and are a reasonable source of energy to meet California's RPS needs?

A: In our opinion out-of-state projects should be considered, but not relied upon too extensively to meet California's RPS needs. While using some out-of-state resources may be necessary, the Commission should keep the utilities' focus on developing in-state resources. Out-of-state resources may also require more transmission needs and planning among multiple states. RETI also produced a database of possible out-of-state generators. This information should be compared to the information in the E3 Calculator, and augmented as appropriate.

7. Q: The final source of project data is the original estimates of DG potential developed by E3 and Black and Veatch. Do you agree that these estimates are plausible and reasonable source of information for a study of this nature?

A: We do not have enough information in this area to comment.

8. Q: The 33% RPS Reference Case relies very heavily on solar thermal resources, which are largely untested at utility scale. Do you believe it is reasonable to rely on 7200 MW of solar thermal resources coming online by 2020?

A: It is a little unfair to make the blanket statement that solar-thermal resources are largely untested at utility scale, particularly considering the fact that some 400 MW of solar-thermal generators (troughs) have been operating under commercial conditions in

California for some 20 years. Nevertheless, it is true that a good deal of the projects that make up the referenced 7,200 MW of solar-thermal-generating capacity under-development do indeed employ technology that has not been commercially demonstrated. As the GPI has argued consistently in the RPS and LTPP proceedings, these projects must be assigned lower expectations of achieving operational status than projects employing commercially-proven technologies.

The question asks whether it is reasonable to rely on the 7,200 MW of solar-thermal-generating capacity coming online by 2020. In fact, it is not reasonable to rely on any particular project or set of projects coming online, regardless of the commercial status of the technology being deployed. Every contract in the portfolio should be treated as having a statistical probability of success. In our opinion, projects with strong developers and employing commercially-proven technology should be assigned an expected-success probability in the neighbourhood of 70 percent, lacking better, project-specific data. Projects based on pre-commercial technologies should be assigned appropriately lower probabilities of success, in some case much lower. If the probabilities assigned are reasonable, and the portfolios are large and diverse enough to avoid statistical anomalies, then planners should be able to rely on the calculated expected value of operating renewable-generating capacity that will result from a given portfolio of contracts.

9. Q: The High Wind Case relies on substantial quantities of in-state resources. However, many of the projects identified are "proxy" projects from the RETI database, rather than projects that have been identified by developers. In addition, solar projects are heavily represented in the PUC Database. Given the model's preference for wind resources due to cost, why do you think that more wind projects haven't been selected for development through IOU solicitations?

A: The GPI is not privy to the solicitation process.

10. Q: The High Out-of-State case relies on substantial quantities of wind from Wyoming and geothermal from northern Nevada. Do you think it is plausible to rely on these resources coming online by 2020, including transmission to California? Are there other challenges with out-of-state resources, such as limited availability of firming and shaping capacity?

A: It is certainly possible for these resources to come online by 2020. The bigger question is whether the transmission needed to bring it to market will be developed. If California allows the use of unbundled RECs for RPS compliance then the power does not have to be transmitted into California, however it does have to go to some load center where it will be adequately valued, and substantial transmission investments will be needed in any scenario. One problem with relying on out of state resources is that as RPS programs and greenhouse-gas reduction laws become more widespread, the resources will be harder to secure as regional competition amps up.

11. Q: The High DG case relies on 15,000 MW of in-state solar PV resources. Do you believe it is plausible to develop PV resources on this scale by 2020? Are there any operational issues associated with relying on this quantity of PV resources that the study did not consider? Are the PV potential estimates reasonable and plausible?

A: The high DG case would be difficult but not impossible to achieve by 2020. The question is: Why are there no scenarios with intermediate levels of DG? Would a case with a more middle amount of DG be possible to develop? The difference could be made up of other in-state resources and out of state resources. One problem with all of the developed scenarios is that they take extreme views of developing the various renewables, rather than optimizing on a balanced mix of renewables.

12. Q: All of the cases assume that new transmission is required to deliver most (but not all) of the RPS resources to load. Do you agree that new transmission is needed to most cases, or are new resources likely to be able to make more use of the existing transmission system, e.g., by displacing existing fossil resources in the hourly dispatch?

A: California's existing transmission system is inadequate for serving the load that currently exists in the state. Regardless of the composition of the future mix of generating sources that feed the grid, major transmission investments will be needed. Most of the transmission elements that are included in the conceptual transmission plan that was recently released in the phase 2A report of RETI are categorized as "no regrets" investments, which means that they are probably needed regardless of the composition of the future energy supply mix. Even in the case of the Tehachapi transmission project, which was conceived specifically to bring transmission access to a known wind-resource-rich region of the state, fully half of the proposed investment will be for transmission elements that were identified as needed in the system long before the development of the Tehachapi project was initiated. When all of the state's transmission needs are assessed to the development of renewable resources, simply because those are the supply resources highest in the state's loading order, it makes the costs of instituting the renewables program look much higher than they really are. The RETI report notes:

> The Phase 2A conceptual transmission plan is designed to facilitate meeting the goal of obtaining 33% of the state's electricity from renewables by 2020. But large investments in transmission infrastructure will be needed between now and 2020, regardless of state energy-supply mix. Many elements of the RETI conceptual transmission plan would likely be required under non-renewables-based planning scenarios. The estimate of the aggregate cost of the conceptual transmission plan presented in this report thus cannot be attributed only to the state's renewable-energy programs. [RETI Phase 2A Final Report, page 1-2.]

13. Q: Do you believe it would be an improvement to the study methodology to account for the ability of the existing transmission system to accommodate new renewable resources? What would be a good method of doing this?

A: It would be an improvement in the study methodology to give equal consideration to resources located outside of CREZs, particularly those with minimal transmission needs, as to resources located inside CREZs. It should be noted that at all stages of transmission planning, upgrades to the existing system are always considered before new transmission elements are contemplated. That is simply good engineering practice.

14. Q: Do you believe that a detailed mapping of 33% RPS resources is valuable for transmission and procurement planning? Why or why not?

A: We think it is useful because it helps to show what kinds of transmission investment might be needed, and how much procurement will be needed. However new technologies and other unpredictable changes to the study scenarios need to be taken into account, and are hard to map. All of these kinds of studies need to be taken as planning resources and not used as an actual reality.

15. Q: Please include any additional comments on the report, including the implementation timelines and assumptions used to build the implementation timelines?

Dated August 28, 2008, at Berkeley, California.

Respectfully Submitted,

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